CSEC Physics Exam Breakdown

Matthew Williams • Physics • May 20, 2026

CSEC Physics Exam Breakdown

Format

CSEC Physics assesses three profile dimensions across all papers:

Profile	What it tests	Weighting
Knowledge and Comprehension (KC)	Recall, definitions, identification, basic concepts	30%
Use of Knowledge (UK)	Application, calculation, explanation, prediction	50%
Experimental Skills (XS)	Planning, measurement, analysis, interpretation	20%

Total marks: **200**

The exam has three components.

Component	Format	Duration	Marks	% of Total
Paper 01	60 multiple-choice items	1 hr 15 min	60	30%
Paper 02	Structured and extended response	2 hr 30 min	100	50%
Paper 031 (SBA)	School-Based Assessment	School-assessed	40	20%
Paper 032 (private candidates)	Practical examination	2 hr 10 min	40	20%

Paper 01, Multiple Choice

Duration: 1 hour 15 minutes

Questions: 60 items, each with four options (A-D)

Questions are drawn from all five syllabus sections. They test recognition, recall, simple calculation, and diagram interpretation. Paper 01 moves fast. If you genuinely do not know an answer, eliminate the two most obviously wrong options and move on.

> 📝 **Exam Tip**
> Paper 01 rewards breadth. A student who has revised all five sections at a basic level will outscore one who knows two sections deeply and blanks on the rest.

Paper 02, Structured and Extended Response

Duration: 2 hours 30 minutes

Structure: Section A (compulsory) + Section B (choice)

Section A

Three compulsory questions. The first question (worth 25 marks) is always a data analysis or graphical investigation. You are given experimental data and must plot a graph, calculate a gradient, and use it to determine a physical quantity. Past data-analysis questions have covered:

- Half-life decay curves (plot activity vs time, read off half-life values)
- Spring extension (plot force-extension, find spring constant from gradient)
- Lens focal length (plot 1/u vs 1/v, read the intercept)
- Transformer voltage ratio (plot V›vs Všfind gradient = N›Nš
- Specific heat capacity (plot temperature vs time, find gradient to calculate c)

The remaining two compulsory questions are structured, covering topics from any syllabus section.

Section B

Three questions, of which you answer two. These are extended response questions requiring longer explanations, multi-step calculations, or combined reasoning. Topics rotate across the five sections, typically one question from electricity/magnetism, one from atomic physics, and one from mechanics or thermal physics.

> 📝 **Exam Tip**
> In Paper 02, show all working even if you cannot reach a final numerical answer. Marks are awarded for correct method, correct substitution, and correct units separately. A wrong answer with a clear method still earns most of the marks.

Paper 031, School-Based Assessment

The SBA assesses practical skills over the two-year course. A minimum of seven practical investigations must be completed, covering each section of the syllabus. The mandatory practicals are:

- 1. Simple pendulum
- 2. Conservation of momentum or energy
- 3. Specific heat capacity or specific latent heat
- 4. Refraction
- 5. Series and parallel circuits
- 6. I-V characteristics
- 7. Radioactivity (simulation using dice or cubes)

Four skills are assessed:

Skill	What is expected
Planning and Designing (PD)	State aim, hypothesis, variables, method, expected results
Manipulation and Measurement (MM)	Use equipment correctly, take accurate readings
Observation, Recording, Reporting (ORR)	Record data in tables, draw diagrams, use correct format
Analysis and Interpretation (AI)	Calculate, identify patterns, draw conclusions, evaluate errors

> 📝 **Exam Tip**
> SBA marks are awarded on the quality of your write-up, not just whether your results are "correct". A well-documented experiment with a clear conclusion and identified limitations earns full marks even if your measured value differs from the accepted one.

Paper 032, Alternative to SBA (Private Candidates)

Duration: 2 hours 10 minutes

This paper replaces the SBA for private candidates. It tests the same four skills through written questions that describe experimental situations. You may be asked to design an experiment, analyse given data, identify sources of error, or suggest improvements.

Syllabus Structure

The syllabus is divided into five sections. Paper 02 questions draw from all five sections each year.

Section A, Mechanics

The foundation section. Topics build on each other, so a gap early on compounds.

- Measurement: SI units, significant figures, density, measuring instruments
- Scalars and vectors: resultant, resolution, triangle of forces
- Statics: moments, levers, centre of gravity, stability, Hooke's Law
- Dynamics: velocity-time graphs, Newton's three laws, linear momentum, collisions
- Energy: work, kinetic and potential energy, power, efficiency, alternative energy
- Hydrostatics: pressure, fluid pressure, Archimedes' Principle

Section B, Thermal Physics

Requires both kinetic theory reasoning and numerical calculation.

- Nature of heat: caloric vs kinetic theory, Joule's experiments
- Temperature: thermometers, fixed points, Celsius scale, thermal expansion
- Gas laws: Boyle's, Charles', Pressure Law, general gas law, Kelvin scale
- Thermal measurements: specific heat capacity, specific latent heat, evaporation vs boiling
- Heat transfer: conduction, convection, radiation, applications

Section C, Waves and Optics

A mix of definition, diagram, and calculation.

- Wave motion: transverse vs longitudinal, v = f»wave graphs
- Sound: production, propagation, pitch, loudness, speed, ultrasound

- Electromagnetic spectrum: properties, types, sources, uses
- Light: reflection, refraction, total internal reflection, fibre optics, dispersion
- Lenses: ray diagrams, magnification, lens formula

Section D, Electricity and Magnetism

The most calculation-heavy section. Also the one with the most applied/practical questions.

- Electrostatics: charging, electric fields, applications and hazards
- Current electricity: $I = Q/t$, resistance, Ohm's Law, I-V characteristics
- Circuits: series and parallel, equivalent resistance, circuit analysis
- Electrical power: $P = IV$, energy, efficiency, domestic wiring and safety
- AC and DC: generators, rectification, period and frequency
- Electronics: diodes, logic gates, truth tables
- Magnetism: field patterns, permanent vs temporary magnets
- Electromagnetism: motors, generators, transformers

Section E, Physics of the Atom

Requires understanding of nuclear notation, radioactive decay, and nuclear energy.

- Atomic models: Thomson, Rutherford, Bohr, Chadwick, Geiger-Marsden experiment
- Atomic structure: nuclide notation, isotopes, mass number, proton number
- Radioactivity: alpha, beta, gamma properties, half-life, detection, applications
- Nuclear energy: fission, fusion, $E = \gamma mc^2$, arguments for and against nuclear power

How You Are Actually Tested

Knowledge

Paper 01 and the short-answer parts of Paper 02 test whether you know definitions, units, and facts precisely. "Resistance is opposition to current flow" is not specific enough. "Resistance is the ratio of potential difference across a conductor to the current flowing through it" is.

Application

Most of Paper 02 tests whether you can use what you know to solve unfamiliar problems. This means substituting correctly into formulas, drawing correct ray diagrams, and applying principles such as conservation of momentum to collisions you have never seen before.

Analysis

The data analysis question in Paper 02 tests whether you can extract information from a graph, calculate a gradient, and relate it to a physical quantity through an equation. Practice this skill explicitly, it is the highest-value single question on the paper.

Common Mistakes

- Giving the formula but not substituting values before stating the answer
- Forgetting units, or using inconsistent units (e.g. grams instead of kilograms)
- Drawing ray diagrams without a ruler, or without labelling focal points
- Describing radioactive emissions without specifying charge and relative penetrating power
- Confusing mass and weight, or speed and velocity
- Writing "energy is lost" without stating what it is converted to

Study Strategy

Build Section A First

Mechanics is the backbone. The concepts of force, energy, and momentum appear throughout other sections, including thermal physics (specific heat, gas laws) and electromagnetism (motor force, transformer power).

Learn to Draw Diagrams

Ray diagrams, circuit diagrams, field line patterns, and force arrow diagrams appear every year. Practice drawing them accurately with a ruler and label every element.

Master the Data Analysis Format

The 25-mark graph question follows a predictable structure:

- 1. Plot the points correctly (1 mark per point, usually 6-8 points)
- 2. Draw a best-fit curve or straight line
- 3. Calculate the gradient (show triangle, read coordinates)
- 4. Use the gradient with a given equation to find a quantity

Practice this with past papers until it takes under 20 minutes.

Practice Past Papers

The question patterns are consistent. The 2015-2024 May/June Paper 2 questions cover the same pool of topics with small variations. Use them to identify which topics appear annually (radioactivity, specific heat, lenses, transformers, momentum) and make sure you can answer those in your sleep.